

**GZJ KDV 54**

IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF OHIO  
EASTERN DIVISION

5 IN RE: NATIONAL : HON. DAN A.  
PRESCRIPTION OPIATE : POLSTER  
6 LITIGATION :  
7 This document relates to: : NO.  
8 County of Cuyahoga, et : 1:17-MD-2804  
al. v. Purdue Pharma L.P., :  
9 et al., Case No. 17-OP- :  
45004 (N.D. Ohio) :  
10 :  
11 County of Summit, Ohio et :  
al. v. Purdue Pharma L.P., :  
12 et al., Case No. 18-OP- :  
45090 (N.D. Ohio) :

- HIGHLY CONFIDENTIAL -

14 SUBJECT TO FURTHER CONFIDENTIALITY REVIEW

April 25, 2019

## Videotaped deposition of

17 JONATHAN GRUBER, Ph.D., taken pursuant to  
notice, was held at the law offices of  
Robins Kaplan, 800 Boylston Street,  
18 Boston, Massachusetts, beginning at 10:06  
a.m., on the above date, before Michelle  
19 L. Gray, a Registered Professional  
Reporter, Certified Shorthand Reporter,  
20 Certified Realtime Reporter, and Notary  
Public.

— — —

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1                   correct.

2 BY MR. GEISE:

3                   Q. Continuing in Paragraph 72,  
4 you write, "The relationship between the  
5 rapid rise in prescription opioid  
6 shipments and the increase in  
7 opioid-related mortality since the mid  
8 1990s is readily apparent when comparing  
9 differences across geographic areas and  
10 opioid shipments received between 1997 to  
11 2010 and the growth of opioid dependence  
12 and mortality."

13                   Do you see that?

14                   A. Yes, I do.

15                   Q. And then you continue by  
16 saying your discussion here identifies  
17 and illustrates these major trends,  
18 right?

19                   A. That's what it says, yes.

20                   Q. Now, according to the layout  
21 in your textbook that we looked at  
22 earlier, a correlation between increasing  
23 opioid shipments and increasing opioid  
24 mortality could have three possible

1 explanations, correct?

2 MR. KO: Object to the form.

3 THE WITNESS: In general, in  
4 theory there are three possible  
5 relationships.

6 In this, A could cause B, B  
7 could cause A, or there could be a  
8 third variable causing both. It's  
9 hard in this context to think  
10 about how mortality would be  
11 causing increased shipments. So  
12 I'm not sure all three conditions  
13 apply in this context.

14 BY MR. GEISE:

15 Q. So the -- A causing B here  
16 would be increases in opioid shipments  
17 caused the increase in opioid mortality,  
18 correct?

19 A. That's correct.

20 Q. B here would be an increase  
21 in opioid mortality caused an increase in  
22 opioid shipments?

23 A. That would be with the  
24 parallel.

1                   Q.         And then the third option is  
2                   that some other variable caused both the  
3                   increase in opioid shipments and the  
4                   increase in opioid mortality, correct?

5                   A.         Correct.

6                   Q.         Now, in your report, you  
7                   spend most of your time discussing that  
8                   first variable, that opioid shipments  
9                   cause the increase in opioid mortality,  
10                  correct?

11                  MR. KO: Object to the form.

12                  THE WITNESS: Your question,  
13                  I -- it's not a first variable. I  
14                  spend most of the time discussing  
15                  that first explanation.

16 BY MR. GEISE:

17                  Q.         Okay. Did you perform any  
18                  analysis with regard to the second two  
19                  options?

20                  MR. KO: Object to the form.

21                  THE WITNESS: I did not  
22                  perform analysis with regards to  
23                  higher mortality causing higher  
24                  prescriptions. That's

1 implausible.

2 I did perform a number of  
3 analyses and considerations  
4 regarding to the third possibility  
5 that there's an omitted factor  
6 causing both.

7 BY MR. GEISE:

8 Q. And those factors or  
9 variables that you considered are the  
10 ones you identified with the  
11 demographics, the economic activity, and  
12 non-opioid mortality?

13 A. The -- those are the three  
14 things I considered. They are -- they  
15 can represent, not only those three  
16 things but they can represent testing  
17 larger hypotheses as well. But those are  
18 the three factors I considered.

19 Q. Let me direct your attention  
20 to Paragraph 74 of your report.

21 In the first sentence you  
22 write, "The extreme variation in per  
23 capita shipments across areas suggest  
24 that prescription activity which drives

1 BY MR. GEISE:

2 Q. Understand. In Paragraph 74  
3 of your report though, you state that the  
4 variation in per capita shipments  
5 suggests that prescription activity,  
6 which drives shipments to an area, bears  
7 little relationship to medical need.

8 Do you see that?

9 A. That's correct.

10 Q. And my question is, you did  
11 not perform any analysis of that  
12 prescription activity, correct?

13 A. That's correct.

14 Q. Similarly, you didn't  
15 perform any analysis of medical need in  
16 any particular area; is that correct?

17 MR. KO: Object to the form.

18 THE WITNESS: No, that's not  
19 correct.

20 BY MR. GEISE:

21 Q. It's not? What did you do  
22 to perform an analysis of medical need?

23 A. As we described in the  
24 paper, we said that medical need is

1 primarily proxy by demographic factors.  
2 And so for example, as I said here, for  
3 example, a county with an older  
4 population would be expected to have  
5 greater demand for prescription pain  
6 medications. Therefore, we -- I assessed  
7 whether variation in demographic factors,  
8 which we correlate with medical need, is  
9 responsible for this wide variation we  
10 see.

11 Q. Is it your opinion that  
12 there is no correlation between medical  
13 need and prescription activity?

14 MR. KO: Object to the form.

15 THE WITNESS: No. That's  
16 not my opinion.

17 BY MR. GEISE:

18 Q. So you agree there is a  
19 correlation between medical need and  
20 prescription activity?

21 MR. KO: Same objection.

22 THE WITNESS: I have not  
23 conducted a study of the  
24 relationship between -- between

1                   medical need and prescription  
2                   activity.

3       BY MR. GEISE:

4                   Q.       So in paragraph 74 of your  
5                   report, you say that you have -- you say  
6                   the prescription activity bears little  
7                   relationship to medical need. But you  
8                   haven't conducted a study of the  
9                   relationship between medical need and  
10                  prescription activity; is that correct?

11                  MR. KO: Object to the form.

12                  THE WITNESS: As I've said,  
13                  we use, as a proxy for medical  
14                  need, demographic characteristics,  
15                  and ask how much of this extreme  
16                  variation in shipments that we see  
17                  can be explained by this proxy for  
18                  medical need. And the answer is  
19                  very, very little.

20       BY MR. GEISE:

21                  Q.       So have you conducted a  
22                  study of the relationship between medical  
23                  need and prescription activity?

24                  MR. KO: Objection. Asked

1 and answered.

2 THE WITNESS: Once again, we  
3 have done -- medical need is a  
4 term of -- it's not -- that's not  
5 a strictly scientific definition  
6 of medical need.

7 We've done -- as I said, we  
8 have a proxy, which we think  
9 should be closely associated with  
10 medical need. And if it is true  
11 that medical need drove this  
12 extreme variation across counties,  
13 then it would be true that when we  
14 included this proxy, you would  
15 typically expect that to explain a  
16 significant part of the variation  
17 across counties where in fact it  
18 explains almost none.

19 BY MR. GEISE:

20 Q. Do you agree that medical  
21 need in individual cases is determined by  
22 physicians and prescribers with input  
23 from their patients?

24 MR. KO: Object to the form.

1 BY MR. GEISE:

2 Q. But what you're comparing is  
3 only the highest and lowest shipment  
4 areas, correct?

5 A. And as -- as I'm -- as I'm  
6 doing, as I explained, the reason I'm  
7 doing that is to try to create a format  
8 which can illustrate clearly the causal  
9 relationship between shipments and harms.  
10 And that we think is the best way to do  
11 it.

12 Q. What results would you find  
13 if you compared the second and third  
14 quartiles as opposed to the highest and  
15 lowest shipment areas with regard to  
16 addressing the measurement error?

17 A. I don't know for sure. But  
18 the -- once again, as I described with  
19 measurement error, if there's some  
20 measurement error, then obviously the  
21 more you really distinguish clear groups,  
22 like the top and the bottom, the -- the  
23 stronger your conclusions can be.

24 Q. A moment ago in one of your

1 answers, you said that there is -- there  
2 is higher consumption in areas with  
3 higher shipments. Did I hear that  
4 correctly?

5 A. Yes, yes.

6 Q. Is that a causal  
7 relationship?

8 MR. KO: Object to the form.

9 THE WITNESS: I mean they  
10 are basically shipments -- yes,  
11 it's a causal relationship, yeah,  
12 that's right.

13 BY MR. GEISE:

14 Q. You said that you used  
15 shipments as a proxy for consumption.  
16 But by that answer you're telling me that  
17 consumption is caused by the shipments.

18 A. That's a good point.

19 MR. KO: Is there a  
20 question?

21 MR. GEISE: Yes.

22 THE WITNESS: I guess in  
23 this -- the way -- the reason I'm  
24 using shipments is as a proxy for

1 because of these various factors,  
2 crackdown on the prescription opioid  
3 market, which cause people to shift to  
4 illicit opioids. So naturally you're  
5 going to see shipments declining while  
6 the harms of illicit opioids go up.

7 Q. So in the period of time  
8 before 2010, the correlation you find is  
9 an increase in shipments and an increase  
10 in opioid mortality, correct?

11 MR. KO: Object to the form.

12 THE WITNESS: Once again, as  
13 I already in the report, we  
14 established a causal relationship  
15 here, not just a correlation. And  
16 we're doing that is by -- is by  
17 splitting these two types of  
18 counties, which were once again  
19 similar in the mortality rates  
20 before 2000 and yet diverged.

21 So I believe we're showing  
22 that there was a causal  
23 relationship that before 2010, the  
24 rise -- the places that saw the

1           big growths in shipments, were  
2           also the places that saw the big  
3           increase in prescription  
4           overdose -- prescription opioid  
5           overdose mortality.

6       BY MR. GEISE:

7           Q.       Then after 2010 when the  
8           prescription opioid shipments decrease,  
9           there continues to be an increase in  
10          opioid mortality in those counties?

11           A.       In -- in those counties as I  
12          illustrate later in the -- in the later  
13          figures, there continues to be an  
14          increase because those counties had  
15          people who were already addicted to  
16          opioids and they moved onto illicit  
17          opioids.

18           Q.       Well, we'll talk about the  
19          moving on point later. But from  
20          statistical examination of it, when the  
21          shipments go down, the mortality rate is  
22          going up?

23           A.       When the shipments of  
24          prescription opioids are falling, in --

1 mortality rates were equal?

2 MR. KO: Object to the form.

3 THE WITNESS: I don't

4 understand the question.

5 BY MR. GEISE:

6 Q. Sure. So here you have --

7 you split between the top quartile and

8 the bottom quartile in terms of

9 shipments, correct?

10 A. Correct.

11 Q. And even at the beginning of

12 1999, the mortality rate is higher in the

13 counties with the top 25 shipments

14 compared with the bottom 25, correct?

15 A. Correct.

16 Q. What I'm saying is do you

17 know -- and I think you said you don't

18 know if there was ever a time when the

19 mortality rate was the same in those two

20 quartiles, correct?

21 A. And as I said before, I

22 don't know. But the reason I really feel

23 that I need to know is because the

24 evidence is clear from the time period we

1 present to make the causal case that in  
2 those counties with high shipments,  
3 that's where the illicit deaths went up  
4 the most.

5 Q. Wouldn't it be relevant to  
6 your analysis if the shipment into those  
7 counties -- how that shipment into those  
8 counties compared if their mortality  
9 rates were equal?

10 MR. KO: Object to the form.

11 THE WITNESS: No, it  
12 wouldn't, because the key causal  
13 change this report establishes is  
14 that the increase in use in harm  
15 from illicit opioids arose after,  
16 primarily, after the crackdown  
17 through abuse deterrent  
18 formulations, PDMPs, pill mills,  
19 et cetera, in prescription  
20 opioids.

21 So in showing the decade  
22 before that and showing that these  
23 two places are on parallel  
24 trends -- they are different. I

1       But we did not specifically conduct an  
2       empirical analysis of the effect of  
3       Mexican trafficking.

4                   Q.       Did you conduct any analysis  
5       as to whether a reduced social stigma in  
6       connection with the use of heroin was a  
7       factor in the increase in heroin  
8       mortality after 2010?

9                   MR. KO:   Object to the form.  
10                  Objection. Foundation.

11                  THE WITNESS:   So let me be  
12       clear on what we did. We did, in  
13       this report, several things.

14                  First, we show a very  
15       striking change in heroin  
16       mortality at exactly the point  
17       when these -- when these changes  
18       were coming online.

19                  We also then, as following  
20       standard empirical practice, said,  
21       well, let's make sure -- so we  
22       did -- we did three things.

23                  We looked at -- we saw the  
24       striking time series change. We

1 show heroin and fentanyl mortality  
2 go up most in the places that had  
3 the more shipments. And we then,  
4 as is standard empirical practice,  
5 tried to rule out other factors  
6 that could explain that.

7 The primary hypotheses of  
8 what could explain that are  
9 changes in economic conditions and  
10 changes in stigma or other  
11 attitudes.

12 And the proxies for that is  
13 to ask, well, did non-opioid  
14 mortality change? If other things  
15 were changing which caused people  
16 to, say, be less averse to using  
17 drugs and that led to more death,  
18 you'd see or more deaths from  
19 non-opioids, and you don't. Or  
20 you don't see that differential  
21 emerging across these counties.

22 BY MR. GEISE:

23 Q. Well, did you conduct any  
24 analysis as to how many post-2010 deaths

1                   Q.         Do any of the five studies  
2         address manufacturers' shipments of  
3         prescription opioids?

4                   A.         I don't know what you mean  
5         by address. Can you maybe be clearer of  
6         what you're asking? I don't understand.

7                   Q.         Mention, discuss?

8                   A.         I don't recall if they do.

9                   Q.         Do any of the five studies  
10       mention or discuss the distributors'  
11       shipments of prescription opioids?

12                  A.         I don't recall.

13                  Q.         Do you agree that the  
14       studies upon which you rely do not  
15       examine the causal effect of any conduct  
16       by the defendants?

17                  MR. KO: Object to the form.

18                  THE WITNESS: Once again,  
19       the -- the -- there's two elements  
20       wrapped up in that statement.

21                  There's the question of causal and  
22       the question of defendants.

23                  As we said, these are not  
24       causal studies, the standards of

1                   the economics literature. They  
2                   are part of a suite of evidence  
3                   I'm developing that show  
4                   epidemiologically why a link makes  
5                   sense of the type that I'm sort of  
6                   showing statistically the  
7                   economics analysis.

8                   The second question is  
9                   defendants. I don't believe they  
10                  focus specifically on the  
11                  defendants, but the defendants do  
12                  represent the majority of opioid  
13                  manufacture and shipment. And  
14                  they do in at least some studies,  
15                  like the one we just looked at,  
16                  talk about a drug produced  
17                  primarily by the defendants, if  
18                  not exclusively, in OxyContin.

19                  BY MR. GEISE:

20                  Q.        You said that the studies  
21                  you look at show that the link makes  
22                  sense. Do you recall using that term?

23                  A.        Yes.

24                  Q.        Okay. Would you agree that

1 even if the studies show that the link  
2 makes sense, these studies themselves do  
3 not prove a causal relationship?

4 A. These studies do not prove a  
5 causal relationship to the standards that  
6 we use in economics literature.

7 Q. So looking specifically at  
8 this sentence and Paragraph 89 of your  
9 report, Professor Gruber, isn't it  
10 incorrect to say that these studies  
11 establish that prescription opioids have  
12 become the predominate gateway to heroin  
13 use, a pattern not observed in earlier  
14 decades, and thus that the illicit opioid  
15 crisis is a direct result of defendants'  
16 misconduct?

17 MR. KO: Object to the form.

18 THE WITNESS: I don't think  
19 so.

20 BY MR. GEISE:

21 Q. Would you agree that these  
22 studies, the five studies that you looked  
23 at, do not discuss the defendants'  
24 misconduct or alleged misconduct at all?

1                   manufacturer and distributors, was  
2                   a pathway to the use of illicit  
3                   opioids.

4     BY MR. GEISE:

5                   Q.        But that doesn't -- those  
6                   studies don't talk at all about -- they  
7                   don't label the defendants' activities as  
8                   misconduct at all, correct?

9                   MR. KO: Objection. Asked  
10                  and answered.

11                  THE WITNESS: I don't  
12                  recall.

13     BY MR. GEISE:

14                  Q.        Do you agree that this  
15                  sentence in Paragraph 89 of your report  
16                  overstates what those five studies  
17                  establish regarding the defendants'  
18                  conduct?

19                  MR. KO: Object to the form.

20                  THE WITNESS: Read -- read  
21                  individually, it seems an  
22                  overstatement. But I think if you  
23                  put it in the context of the  
24                  report, I -- as I said, I rely on

1 Professor Rosenthal's report to  
2 talk about the link from  
3 misconduct to the shipments of  
4 opioid. This is part of a body of  
5 evidence that shows the link  
6 between shipments of opioids and  
7 illicit opioid use. And,  
8 therefore, you put those two  
9 together, and that is the basis  
10 for that sentence.

11 BY MR. GEISE:

12 Q. Where that sentence is  
13 contained within your report in Paragraph  
14 89, your answer just referred to more  
15 than just those five studies, correct?

16 A. Yes, it did.

17 Q. And you would agree that you  
18 don't refer to Professor Rosenthal's  
19 report in your Table 1.1 when you talk  
20 about the five studies that you looked  
21 at?

22 A. That's right.

23 Q. And the five studies that  
24 you looked at only examined one possible

1

2 CERTIFICATE

3

4

5

I HEREBY CERTIFY that the witness was duly sworn by me and that the deposition is a true record of the testimony given by the witness.

6

7 It was requested before completion of the deposition that the witness, JONATHAN GRUBER, Ph.D., have 8 the opportunity to read and sign the 9 deposition transcript.

10

11

12

Michelle L. Gray

13

MICHELLE L. GRAY,  
A Registered Professional Reporter, Certified Shorthand Reporter, Certified Realtime Reporter and Notary Public

14

Dated: April 30, 2019

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